Ecosystem – III

- ✓ Flow of energy in ecosystem + Rates in ecosystem
- ✓ Ecological Pyramids
- ✓ Types of Ecosystem
- ✓ Threats to Ecosystem

FLOW OF ENERGY

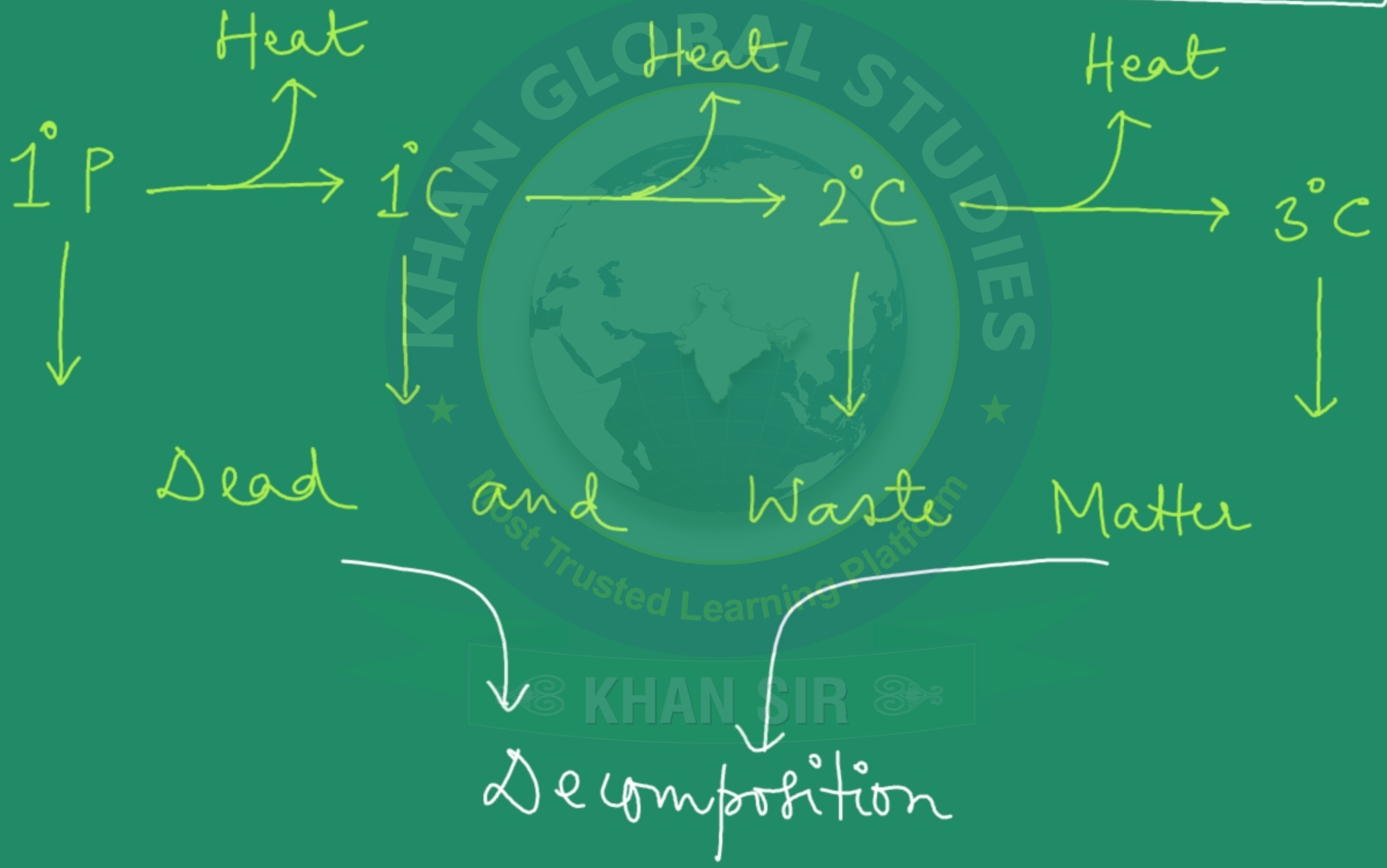
Between Abiota and Biota

- Input into (B): Radiant Energy
- Exit/Release from (B):
  - Heat
  - Bond energy of inorganic mol.

within Biota

Energy flow with biomass flow within a trophic system

Trophic Flow of Energy



2 types of Trophic Systems

Producer driven

✓ Primary production by plants, algae & P.S. bacteria provides biomass to run the trophic system.

Detritus Driven

✓ Dead and waste matter drives the trophic system.

Apex Carnivore

= Top level carnivore

↓

= No higher level predator

Producer Driven

1° Producer (Plants, Algae & PS bacteria) → 1° consumer (Herbivore) → 2° consumer (Carnivore) → 3° consumer (Apex Carnivore)

- ✓ most common
- ✓ most sustainable

Detritus driven

In most ecosystems,

Producer driven trophic system (PDT)

Detritus driven trophic system (DDT)

Run in parallel

If

PDTs > DDTs

↓

Biomass increase in ecosystem

If,

DDTs > PDTs

↓

Biomass decrease in the ecosystem

Result

ECOSYSTEM PRODUCTIVTY

Productivity Rate of production

$$= \frac{\text{Production}}{\text{Area} \times \text{Time}}$$

of ecosystem

→ in case of water bodies, Volume is taken rather than area

1° Production → amount of photosynthetic output

→ 2 types

Gross (GPP) — Total output of photosynthesis

Net (NPP) → actual increase in dry biomass

$NPP = GPP - R$

Gross production − Respiratory consumption of photosynthetic output

R

Secondary Production

- ✓ Amount of biomass added by the primary Consumer
- ✓ Occurs only when the amount of consumed food is in surplus than the demands of respiration

Efficiencies of trophic flow

- Efficiency of ingestion — IE
- Efficiency of assimilation — AE
- Efficiency of production — PE

| E

$$\frac{\text{Amount of biomass ingested}}{\text{Amount of biomass available}} \times 100$$

AE

$$\frac{\text{Amount of food digested}}{\text{Amount of food ingested}} \times 100$$

PE

$$\frac{\text{Amount of biomass added}}{\text{Amount of biomass digest}} \times 100$$

The law 10%

→ Rough approximation
→ Gives an idea of biomass added at each level

From one trophic level to the next, only about 10% of the biomass energy is available